cooling 2–3 cm. zones of petioles and stems to a temperature of 2.5–3° C. In *Bryophyllum*, when such zones of the petiole are cooled, the broken correlation is manifested by development, not only in the notches of the leaf treated, but by development in the notches of the opposite leaf, as well as leaves both up and down the stem. The effect extends farther in the basal direction than in the apical. This indicates marked complexity in the correlation inhibitive effects. In *Phaseolus* the axial buds below the cooled zone grew. In *Saxifraga sarmentosa* the runner tip could be thus isolated. All of these results favor MCCALLUM'S view that correlative effects are brought about by conduction of stimuli, mainly inhibitory stimuli, and not by movements of materials.—WM. CROCKER.

Fermentation.—EULER and SVANBERG[17] made a study of alcoholic fermentation in an alkaline medium in which P=8. Top yeast and *Torula* gave about equal weights of carbon dioxide and alcohol, each equal to 30–33d of the weight of the sugar fermented. Glucose, fructose, and invert sugar were fermented with about equal speed, mannose about 30 per cent as fast, and galactose very slowly. Invertase is active in this medium and maltase inactive. The following are the maximum alkalinities in which cell division occurs in the various yeasts: Frohberg Unterhefe B., $P_H = 7.7–8$; Brennerei Oberhefe S.B. II, $P_H = 7.3–8.4$; *Sacch. ellipsoideus*, $P_H = 7.9$; *Pseudosacch. apiculatus*, $P_H = 7.6$. Increase in weight occurred in S.B. up to $P_H = 8.5$. For Frohberg Unterhefe H the full curve of acid sensitivity was worked out and the optimum was found to be at $P_H = 5$.—WM. CROCKER.

Exudation of water by leaves.—Miss FLOOD[18] has recently investigated the exudation of extremely pure water by the leaf tips of *Colocasia antiquorum*. Examination of sections of leaf tips showed no membrane, or other structure which might act as a filter, between the vascular system of the leaf blade and the pores leading to the tip. Solutions of India ink, gelatine, and starch were forced through the vascular system and exuded at the tips. Exudation from leaves attached to the plant continued at the normal rate when leaf tips were anaesthetized. Miss FLOOD is of the opinion that cells lower down in the plant are responsible for the secretion and filtration of water, but finds no evidence for the existence of such cells except in the root.—J. M. ARTHUR.

Colorado grasslands.—Reviewing the investigations of the grasslands of Colorado by himself and others, RAMALEY[19] enumerates all the associations

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[17] EULER, H., and SVANBERG, O., Enzymatische Studien über Zuckerspaltungen. Hoppe-Seyler Zeit. Physiol. Chem. **105**:187–239. 1919.

[18] FLOOD, MARGARET G., Exudation of water by *Colocasia antiquorum*. Proc. Roy. Dublin Soc. (N.S.) **15**: *pls. 2*. 1919.

[19] RAMALEY, FRANCIS, Xerophytic grasslands at different altitudes in Colorado. Bull. Torr. Bot. Club **46**:37–52. *figs. 2*. 1919.

that have been described. He also gives a brief synopsis of the factors most prominent in the control of such vegetation, and some of the more important floristic differences which characterize the grasslands at different altitudes. A notable reduction of species is manifest with increase of altitude, the estimate running from 160 species for the mesas, 139 for the foothills, and 107 for the montane, to 50 for the subalpine. A systematic list of species is given with indications of their occurrence at different altitudes. The whole, including the bibliography, forms a most useful contribution, summarizing the present state of our knowledge of these plant communities.—GEO. D. FULLER.

Biology of Fomes.—WHITE[20] has made a comprehensive study of the widely distributed *Fomes applanatus*, and finds that it attacks practically all deciduous trees and several conifers, causing the destruction of large quantities of wood annually. It produces basidiospores only, which are not of the ordinary type, being "yellow, papillate, thick-walled chlamydospores within a thin hyaline wall." Spore discharge is enormous and continues for a longer period than recorded for any other fungus, being continuous day and night for about 6 months. There was no difficulty in making artificial cultures, and the appearance of the rotted wood makes it possible to distinguish the attack of this fungus from that of any other form. The histological and chemical details of the attack are fully described.—J. M. C.

Ecology of fungi.—Studying the influence of altitude upon parasitic fungi from collections made by FRAGOSCO in Cataluña, Spain, and by himself in Barreges, DUFRENOY[21] found that the Pyrenees are not a barrier to the dissemination of fungi, although there are certain differences between the fungus flora of the closely adjacent parts of France and Spain. He concludes that there are species peculiar to the plains and to the mountains, as well as those common to both habitats. The determining factor in altitudinal distribution seems to be neither humidity nor temperature, but radiation. The mountain species are either more highly colored or are found on more highly colored hosts. He was unable to determine any effect of altitude upon the resistance of the host.—GEO. D. FULLER.

Pennsylvania trees.—The fact that within 5 years ILLICK'S[22] tree manual has reached its third edition is a striking testimony to its excellence. The first part of the volume is devoted to a general discussion of forests, their structure, development, care, and value receiving careful consideration, and

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[20] WHITE, J. H., On the biology of *Fomes applanatus* (Pers.) Wallr. Trans. Roy. Can. Inst. Toronto 1919: 133–174. *pls. 2–7.*

[21] DUFRENOY, J., Les conditions écologiques du développement des champignons parasites. Etude de géographic botanique. Bull. Soc. Mycol. France **34**:8–26. 1918.

[22] ILLICK, J. S., Pennsylvania trees. 3d ed. pp. 235. *pls. 1–129. figs. 120.* Harrisburg: Dept. Forestry Penn. Bull. **11**: 1919.